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(*Continued on Inside Back Cover*)

THE JOURNAL OF
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Volume 42 May, 1951 Number 5

STUDIES IN REPUTATION
III. CORRELATES OF POPULARITY AMONG ELEMENTARY-SCHOOL CHILDREN*

READ D. TUDDENHAM
University of California

In another report[5] findings were presented on the reputations of the average boy and girl as judged by classmates in Grades I, III, and V. The present investigation is directed toward discovering the traits which characterize boys and girls enjoying high status in their peer groups. A somewhat similar investigation by C. M. Tryon[3] of adolescents indicated that the concomitants of prestige differ for boys and girls, change with age, and depart in many ways from adult attitudes. Findings to be presented here throw light upon the significance of particular traits in determining social acceptance at the grade school level, and augment Tryon's delineation of adolescent values by describing comparable configurations for a younger group.

1. SUBJECTS

The population consisted of 1439 children comprising forty-two classrooms in the public schools of Berkeley, California, who were given the Reputation Test as a part of the research program of the Guidance Study.[2,5] Data are based on four Grade I classes including forty-nine girls and seventy boys, twenty Grade III

* The data of this investigation are from the Guidance Study, which is being carried on at the University of California Institute of Child Welfare under the direction of Dr. Jean W. Macfarlane. The writer wishes to express his appreciation to Dr. Macfarlane and Dr. Harold E. Jones for encouragement and criticism. Clerical and statistical support has been supplied by the WPA and by the U. S. Public Health Service. The Guidance Study proper was made possible by funds from the Laura Spelman Fund, General Education Board, Rockefeller Foundation, and the University of California.

classes including three hundred forty girls and three hundred fifty-two boys, and eighteen Grade V classes including three hundred six girls and three hundred twenty-two boys. Since all the elementary schools of Berkeley were included, it is possible that the present population represented a somewhat wider range with respect to socio-economic status than did Tryon's group from the adjacent city of Oakland. However, similarities between the two samples were much more conspicuous than differences, and since the data in the two researches were collected only three years apart, we regard Tryon's results and our own to be comparable within the limitations imposed by certain differences in the two reputation questionnaires.

2. THE REPUTATION TEST

The Reputation Test, a modification of the Guess Who Technique introduced by Hartshorne and May,[1] consisted of a series of brief word pictures, for each of which the subject was asked to supply the names of those classmates who best fitted the description. The items were arranged in pairs, one item designating the positive extreme* of a dimension, its pair the negative. For example, the dimension subsequently titled Popular—Not Many Friends, consisted of two items:

(+) Who are the ones everybody likes?
(−) Who are the ones nobody likes very much?
(the ones nobody seems to care much about?)

The dimensions included in the test are listed below, together with the letter symbols by which they will be designated in later pages.

Symbol	Item-Pair	
Q	+ Quiet	− Wiggly (can't sit still)
P	+ Popular (everybody likes)	− Not Many Friends (no one seems to care about)
FF	+ Full of Fun (always smiling)	− Serious (seems sort of sad)
Ql−	+ Not Quarrelsome (keeps out of arguments)	− Quarrelsome
C	+ Takes Chances (when playing games)	− Doesn't Take Chances

* The 'positive' end of each dimension was arbitrarily assigned to that item of each pair which was judged to be associated with good social adjustment. All dimensions later proved to have positive correlations with Popular in the six sets of data.

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Symbol	Item-Pair	
B−	+ Not Bossy (gives in to others)	− Bossy
S	+ Good Sport (plays fair)	− Poor Sport (poor loser)
Ba−	+ Not Bashful (in recitation before visitors)	− Bashful (in recitation)
G	+ Good at Games	− Not Good at Games
M−	+ Doesn't Get Mad	− Gets Mad Easily (loses temper)
RB	+ Real Boy (regular fellow) This item-pair for boys only	− Sissy (changed in Grade V to "What boys don't enjoy doing all the things regular boys do?")
LL	+ Acts Like Little Lady (changed in Grade V to "What girls don't like boys' games and just do the things girls do?") This item-pair for girls only	− Tomboy (changed in Grade V to "What girls like to play boys' games and do the things boys do?")

The following item-pairs were added for eleven of the twenty third-grade classrooms:

GL	+ Good Looking	− Not Good Looking (few think are good looking)
Sh−	+ Not a Show Off	− Show Off (acts silly)
L	+ Leader (starts games, suggests things to do)	− Not a Leader (just sits around, never starts things)

The following additional item-pairs were added for the Grade V classrooms:

T	+ Tidy	− Untidy (doesn't look very neat)
F−	+ Doesn't fight	− Fights
Fr	+ Friendly (nice to everybody)	− Not Friendly (doesn't care about making friends)
J	+ Takes Joke on Self	− Can't Take a Joke (gets mad or cries)
BF	+ Best Friend (unpaired item included at all three grade levels and always given last)	

In Grades I and III, the inability of the subjects to read and write easily necessitated administering the test orally to each child and recording his responses. In Grade V, test booklets

adapted to group administration were used to secure responses from an entire class at one sitting.

The score of each child on each dimension was determined by summing algebraically the number of mentions received from classmates (both boys and girls) on the positive and negative items of the pair. This sum was divided by the number present in class to correct for variations in size of class and permit pooling of data for all members of a given sex-grade level group. These scores were then used in calculating correlations between item-pairs. The present study is based upon an analysis of such correlations computed separately for girls and boys at grade levels I, III, and V, a total of six matrices. Since intercorrelation tables of from one hundred thirty to three hundred sixty entries are so complex as to be well-nigh unintelligible, factor analysis was performed on each matrix. Our present concern is with the resulting relationships between abstracted common-factor variables, but it should be remembered that the children were concerned rather with matching concrete word-pictures with the names of actual classmates who fitted them.

3. PROCEDURE

The six intercorrelation matrices presented in Tables I–VI were factored, using the orthometric method of R. C. Tryon[4] in order to make possible comparisons with results of the C. M. Tryon study.* † The Tryon method provides for the extraction of not more than three orthogonal factors at a time. For all six sets of data treated here, the first three factors satisfactorily accounted for the observed variance and additional analyses were not required.‡

Since the purpose of the factor analysis was not to detect an

* Tables I–VI, the six intercorrelation matrices, and Table VII, the augmented factor loadings and communalities resulting from the orthometric analysis, have been omitted from the published report to save space. Interested readers may secure copies from the author.

† The correlation profile analysis used concurrently by C. M. Tryon[3] was employed in the present study only to obtain the preliminary clusters upon which the communalities were based, and will not be discussed.

‡ Correlations determined from factor loadings were not significantly different from the corresponding empirical values except for one coefficient in the data for first grade girls ($r_{G\text{-}S}$) and one for third grade boys ($r_{Q\text{-}FF}$).

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underlying simple structure but merely to represent more simply the interrelationships among item-pairs, each of the six common-factor spaces was rotated to a standard position, thereby facilitating visual comparison of results for the various sex-grade groups.

To this end, the first (X) factor was made to coincide with the vector Popular-Not Many Friends, and may be thought of as representing whatever qualities determine variability in scores on this item-pair. The second (Y) factor was located so as to absorb as much as possible of the variance of Not Bossy-Bossy, and may be regarded as representing whatever attributes are involved in determining variability in scores on Not Bossy-Bossy, except those which are also involved in Popular-Not Many Friends. The direction of the third (Z) factor (whose position was determined by the other two) was taken so that Good at Games would have a positive projection and Not Good at Games a negative in all six analyses.

The resulting factor loadings, together with the communalities (h^2) of the variables, are given in Table VII, and represented geometrically in Figure 1.

Each circular diagram in Figure 1 represents the upper or visible half of a sphere, whose axes correspond to the factors. The X axis (indicated by a dot in the center) is a diameter projecting down 'through the paper.' The Y and Z axes (horizontal and vertical, respectively) are to be thought of as additional diameters through the sphere in the plane of its equator and at right angles to each other and to the X axis. Since all item-pairs had positive correlations with Popular-Not Many Friends (i.e., positive projections on the X axis), only the positive pole of each Reputation Test dimension is plotted, the negative pole falling on the under side of the sphere at the other end of a diameter through the sphere's origin. However, the correlations between variables depend as much on the negative as on the positive items of each pair.

The total common-factor variance of each item-pair has been taken as unity; hence, $X^2 + Y^2 + Z^2 = 1.00$, and the plotted points fall on the surface of the sphere. The common-factor correlation between any two of them equals the cosine of the central angle between their respective vectors. Latitude circles have been drawn on each sphere 15 degrees apart. Two variables lying on a plane through the origin and one band apart have a correlation of .966 (cos. 15°), two bands apart $r = .866$, three bands .707, four bands .500, five bands .259, and six bands .000 (cos. 90°).

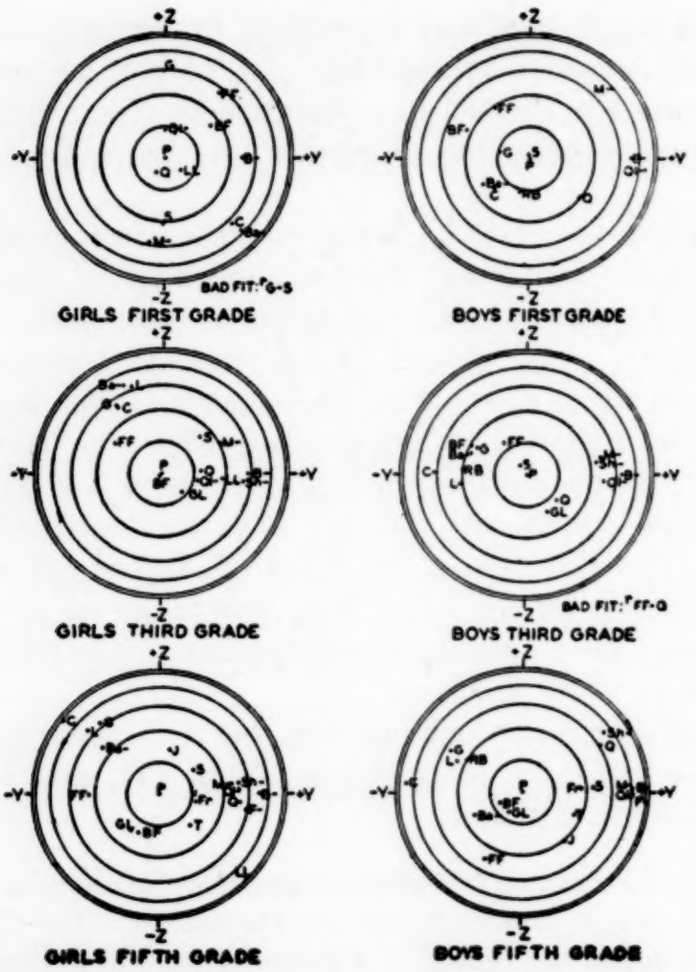

Figure 1. Configurations among Reputation Test Variables.

B——Not Bossy, Ba——Not Bashful. BF—Best Friend. C—Takes Chances. F——Doesn't Fight. FF—Full of Fun. Fr—Friendly. G—Good at Games. GL—Good Looking. J—Can Take a Joke. L—Leader. LL—Little Lady. M——Doesn't Get Mad. P—Popular. Q—Quiet. Ql——Not Quarrelsome. RB—Real Boy. S—Good Sport. Sh——Not a Show Off. T—Tidy.

4. RELATIONSHIPS AMONG ITEM-PAIR VARIABLES OF THE REPUTATION TEST

First-Grade Girls.—For this group of subjects, the variables Popular, Acts Like Little Lady, Quiet, and Not Quarrelsome constitute the only major cluster in the data. Some additional items fall in associated pairs, viz., Takes Chances and Not Bashful, Good Sport and Doesn't Get Mad, and to a lesser degree Best Friend and Full of Fun. (Owing to a poor estimation of the communality of Good at Games, the loadings yield too low an approximation of the correlation between Good at Games and Good Sport.)

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In general, the variables fail to reveal much clustering and are distributed rather widely over the surface of the sphere. However, favorable items tend to have positive correlations not only with Popular, but with Not Bossy, as shown by the absence of points on the left (or Bossy) side of the Y axis.

First-Grade Boys.—The variables most closely associated with Popular for boys are Good Sport and Good at Games, replacing Quiet and Not Quarrelsome in the girls' data.

Real Boy forms with Not Bashful and Takes Chances a second cluster lying very near the Popular cluster, but having an additional element of aggressiveness and daring. (Note that Takes Chances lies on the opposite side of a plane through Popular from Doesn't Get Mad.)

Not Bossy and Not Quarrelsome form a pair, but in contrast to the situation for girls, these variables have only low correlations with the Popular and Real Boy clusters.

Best Friend and Full of Fun form a loose pair for the boys as for the girls, but unlike the girls' data, they have zero or negative correlations with Not Bossy and Not Quarrelsome. Quiet and Doesn't Get Mad fall into no cluster, but have in common the characteristic that both are more nearly independent of Popular for boys than they were for girls.

In general, the beginnings of cluster organization are visible in this diagram. Moreover, there is a rather clear tendency for many favorable items to show lower correlation with Not Bossy than in the results for girls.

Third-Grade Girls.—At the third-grade level there is for both sexes considerably more cluster organization than was apparent in the first-grade data. Furthermore, most of the empirical correlations remain positive but the clusters show a tendency to move apart from each other, as if judgments were being formed more on the basis of specific item content and less on the basis of general halo.

Popular for third-grade girls falls at almost the same position as Best Friend. Children receiving high scores on Best Friend are in fact the most popular in the sense of having many friends, and Popular might better have been titled 'likeable.' However, children at this grade level do not differentiate between the girls they personally like best and the ones 'everybody likes.'

Acts Like Little Lady and its associated variables Quiet and

Not Quarrelsome, which in Grade I went with Popular, now form a cluster midway between Popular and a pair consisting of Not Bossy and Not a Show Off. An added item Good Looking is closer to Popular but probably belongs in the Little Lady group. Traits associated with Acts Like Little Lady appear to characterize the docile and unassertive girls, and seem to have less association with high status in this group than in Grade I.

Another clearly marked cluster is made up of Leader, Not Bashful, Good At Games, and Takes Chances. This group contains the same items which were most closely related to Real Boy for first-grade boys, and seems to characterize the girls who are daring and dominating. Full of Fun falls midway between this group and Popular, and may be considered with them. Variables falling in this group have almost zero correlation with Not Bossy and Not a Show Off, and a very low degree of relationship to the less extreme cluster composed of Quiet, Good Looking, Acts Like Little Lady, and Not Quarrelsome.

The items Good Sport and Doesn't Get Mad remain together as at the first-grade level, and occupy a somewhat intermediate position between the two clusters described. They also have moderately high correlation with Popular.

Third-Grade Boys.—Among this group of subjects, Popular is most closely associated with Good Sport. Both items seem to connote general likeableness, but are not the attributes which confer the most prestige.

As in Grade I, Real Boy is associated with Takes Chances and Not Bashful, and now forms a cluster with them and the additional variables Leader, Good at Games, and Best Friend. The traits in this 'daring-athletic' group characterize the most popular boys and constitute the most valued attributes for boys of this age. Full of Fun is intermediate between this group and Good Sport-Popular.

The variables Not Bossy, Not Quarrelsome, Doesn't Get Mad, and Not a Show Off form a second, 'unassertiveness' cluster. Quiet and Good Looking form a pair related both to Popular and to the 'unassertiveness' traits.

Both the 'unassertiveness' and 'daring-athletic' clusters were found also in the analysis for third-grade girls, but whereas they constituted almost independent dimensions for girls, they seem among the boys to be much more nearly opposed to each other.

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Further, Acts Like Little Lady was associated with the unassertive traits, whereas Real Boy belongs in the 'daring-athletic' cluster. At this third-grade level, Real Boy and Acts Like Little Lady have about equal overlap with the trait Popular, but the 'unassertive' correlates of Acts Like Little Lady have higher correlations with Popular among the girls than among the boys, while items such as Leader and Takes Chances, etc., which are related to Real Boy have higher correlations with Popular among boys than among girls. Clearly, third-graders differentiate sharply between the appropriate patterns for the two sexes, the requisites for boys being daring, motor skills, leadership, and self-confidence; for girls, quiet docility, unaggressiveness, and physical attractiveness.

Fifth-Grade Girls.—The main groupings of variables located in the third-grade data remain intact among fifth-grade girls, but there are interesting differences in the details of organization of the factor spheres.

At this level the item Popular (which should probably have been christened 'Likeable') occupies a position more or less by itself, although it has positive correlations with all the other favorable traits save perhaps Takes Chances (empirical $r = +.12$) and Acts Like Little Lady (empirical $r = +.11$). Among items nearest Popular are Best Friend and Good Looking, which were associated with it in Grade III and perhaps still belong with it, although they now form a much closer pair with each other.

The most closely knit large cluster for this group of subjects comprises the items Not Bossy, Doesn't Fight, Not a Show Off, Not Quarrelsome, Doen't Get Mad, and Quiet. Not only is this cluster more sharply defined for fifth-grade girls than for third-grade girls, but it is much more nearly independent of the Popular dimension, and no longer includes Acts Like Little Lady.

Intermediate between this cluster and Popular are found the items Good Sport (paired with Doesn't Get Mad at both earlier grade levels), Friendly and Tidy. Children named on these items are also relatively quiet and unassertive, but enjoy a larger portion of general status in the group.

Another cluster which was quite sharply defined at the third-grade level for both boys and girls reappears here but in slightly less organized form. Its components are in order Takes Chances (empirical correlation with Popular = .12), Leader and

Good at Games (close together and nearer Popular), and Not Bashful (empirical correlation with Popular = .44).

At the extreme opposite end of a line passing from this cluster through the center of the sphere, and in a quite isolated position, is found the item Acts Like Little Lady. Its empirical correlation with Popular is close to zero, and with component items of the 'daring' cluster just mentioned, it has strong negative correlations. At the factorial level of description, were one to 'reflect' this variable and plot instead its negative pole Tomboy, the new coördinates of the variable would very nearly coincide with those of Takes Chances. Thus, the hypothesis that leadership, daring, and physical skill constitute important aspects of a 'masculine' pattern would seem to be corroborated by their association with 'unfeminine' behavior in girls.

Comparison of the fifth-grade diagram with those for earlier age levels reveals that Little Lady made the most consistent and dramatic shift with age of any item, so far as its correlates are concerned. In the first grade it overlapped almost completely the area of reputation measured by the Popular item. In the third grade it showed a moderate degree of correlation with Popular, but was closer to Not Bossy and Not a Show Off and thus seemed to include a large element of unassertiveness. At the fifth-grade level it was no longer correlated with Popular and appeared as a concomitant of physical timidity, incompetence at games, and the sort of passivity implied by the Not a Leader item.

The peculiar fate of this item might of course be attributed to the fact that the forthright questions, "What girls act like little ladies?" and "What girls are tomboys?" were changed between the third- and fifth-grade test administrations to a rather negative phrasing in terms of boys' rather than girls' behavior, viz., "What girls don't like boys' games at all and just do the things girls do?" and "What girls like to play boys' games and do the things boys do?" But considering all three levels, the consistency of the trend of the Little Lady item away from Popular and other desirable qualities suggests at least the possibility that there is some confusion among children of this age as to what consitutes a positive and desirable feminine pattern. In any case, it is clear that by the fifth grade, tomboys are as apt to be accepted and liked as those who avoid the more active, masculine patterns.

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The two remaining variables at the fifth grade level, Full of Fun and Can Take a Joke both have moderate projections on the Popular axis. However, Full of Fun is more closely related to Not Bashful and other components of the "daring" cluster, while Can Take a Joke has greatest overlap with Good Sport.

Fifth-Grade Boys.—At this level, Popular, Best Friend, Good Looking, and Not Bashful form a central cluster.

Real Boy continues as in Grade III to be most closely related to Good at Games and Leader. However, at this level the major cluster located for third-graders tends to be differentiated into smaller groups. Best Friend and Not Bashful are now closer to Popular, and Takes Chances, which even in Grade III was less related to Popular than others of the Real Boy group, has now moved somewhat further away, although it probably still belongs in this group. Despite these changes, the item Real Boy continues as at previous levels to be associated primarily with athletic skill, leadership, and daring. This consistent relationship, in marked contrast to the shifting correlates of Acts Like Little Lady, suggests that the approved pattern for boys is much clearer than that for girls.

The items Not Bossy, Doesn't Get Mad, and Not Quarrelsome, which were associated in the third grade in the 'unassertiveness' group, plus the added item Doesn't Fight, form another close cluster. These four variables are even more independent of the rest of the test than at the third-grade level, showing a near-zero correlation with Popular and such strongly inverse correlations with Takes Chances that the negative of the latter item would fall near this group. Most of the empirical correlations between the items of this cluster and the Leader-Good at Games-Real Boy group are negative. Real Boys are frequently Bossy, and mentions on the antonyms of unassertive items are common for boys the remainder of whose records are wholly favorable.

Not a Show Off, which for third-grade boys and fifth-grade girls belonged with Not Bossy, forms now a pair with Quiet, which formerly was associated with Good Looking. Not a Show Off and Quiet are correlated with the unassertiveness cluster mentioned above, with Popular, and especially with Friendly and Good Sport. These facts taken together suggest that the third-grade cluster whose components seemed to measure amiable unassertive behavior has now been differentiated into two parts,

one connoting submissiveness and physical timidity, the other quiet and reserve.

The items Friendly and Good Sport form a pair midway between Popular and the unassertive group and have considerable overlap with both. They seem to be used to distinguish the docile, gentle, but not extremely submissive boys. Friendly and Good Sport show about the same degree of correlation with Popular as do Real Boy and Good at Games, but have much lower direct correlations with the latter pair. In this connection it is interesting to note that movement of the item Good Sport away from Good at Games toward the unassertive group of items grows consistently more marked with increasing age level.

Full of Fun, a residual, falls at the opposite end of a diameter through Popular to Quiet and Not a Show Off, with which latter variables it has negative correlations. For girls these correlations are approximately zero, and it is probable that Full of Fun connotes a much more boisterous and robust variety of humor for boys than for girls. Can Take a Joke on Self, also a residual, is most closely related in the sphere to Tidy, and has substantial empirical correlations with Popular, Good Sport, and Friendly. Tidy shows the same sorts of overlap. Its highest empirical correlation is with Popular ($r = .63$), a finding one might not anticipate in boys of this age, although Tryon reports for boys in Grade VII a correlation of $-.27$ between Popular and an item corresponding to the negative of Tidy.* Its next highest empirical correlation is with Good Looking, a finding which is psychologically understandable enough, but in the common-factor sphere it is related more to Friendly and Good Sport.

5. SUMMARY OF GRADE-LEVEL CHANGES IN CLUSTER COMPOSITION OF REPUTATION TEST VARIABLES

In Table VIII are summarized the changes in clusters of Reputation Test variables for the sex-grade level groups treated. The cluster organizations reported by C. M. Tryon for her populations of seventh- and ninth-graders (twelve-year-olds and fifteen-year-olds, respectively) have been included in parallel columns to facilitate tracing the cluster relationships of individual variables over the entire range from Grade I to Grade IX.†

* See Tryon, C. M.,[3] p. 15.

† Columns for Grades VII and IX adapted from Tryon,[3] Table 7, p. 23.

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The brackets indicate the variables which appear to form clusters for a given sex-grade level group. Unbracketed items are residual variables belonging to no cluster. To assist the reader in observing changes in the constellation, arrows are used to follow each trait through the five grade levels.* Dotted arrows connect traits in those two instances where a trait vector belonging in a cluster at one level falls outside any cluster at the next level, but instead is replaced in the cluster configuration by its opposite. The items used by Tryon differ from the ones used in Grades I, III, and V, with the consequence that certain items used in one study have no counterparts in the other. However, those of hers which are similar in content to items of ours have been treated as equivalents of our items, and connected with them by arrows when appropriate. The Tryon variables Assured-Adults, Grown Up, and Older Friends, which were residual variables in her analysis and which have no counterparts in our test, have been omitted from the table. Tryon items marked '(r)' have been 'reflected' (i.e., reversed in title and sign) in order to make the item titles in the two researches consistent.† Despite certain minor differences in emphasis, the close congruence of results from Tryon's study with those from the present one is apparent from the table.

Both investigations are in agreement that the attributes of athletic competence, daring, and leadership constitute the cardinal sources of prestige for boys, whereas traits connoting docility and unassertiveness tend to be rejected. Since the two studies cover between them the entire elementary and junior high school period, it is clear that this pattern is stable over a considerable age range.

Probably central in the boys' constellation of values is athletic

---

* It should be emphasized that Table VIII represents a considerable oversimplification of the relationships obtaining in the factor spheres and in the original correlation matrices. Clusters are not actually as discrete as may seem to be implied by the table, and the assignment of a variable to one or the other of two contiguous clusters is a matter of subjective judgment.

† In both studies a reputation variable is regarded as a bipolar continuum, and scores on it are assigned by algebraic summation of votes on the positive and negative items of the constituent pair. It follows that no violence is done to a cluster by 'reflecting' all its constituent variables, although its relationship to other 'unreflected' clusters is, of course, altered.

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TABLE VIII.—CLUSTER ORGANIZATION OF REPUTATION TEST VARIABLES. (GIRLS)

Brackets indicate clusters. Solid arrows connect equivalent items. Broken arrows connect items with their antonyms.

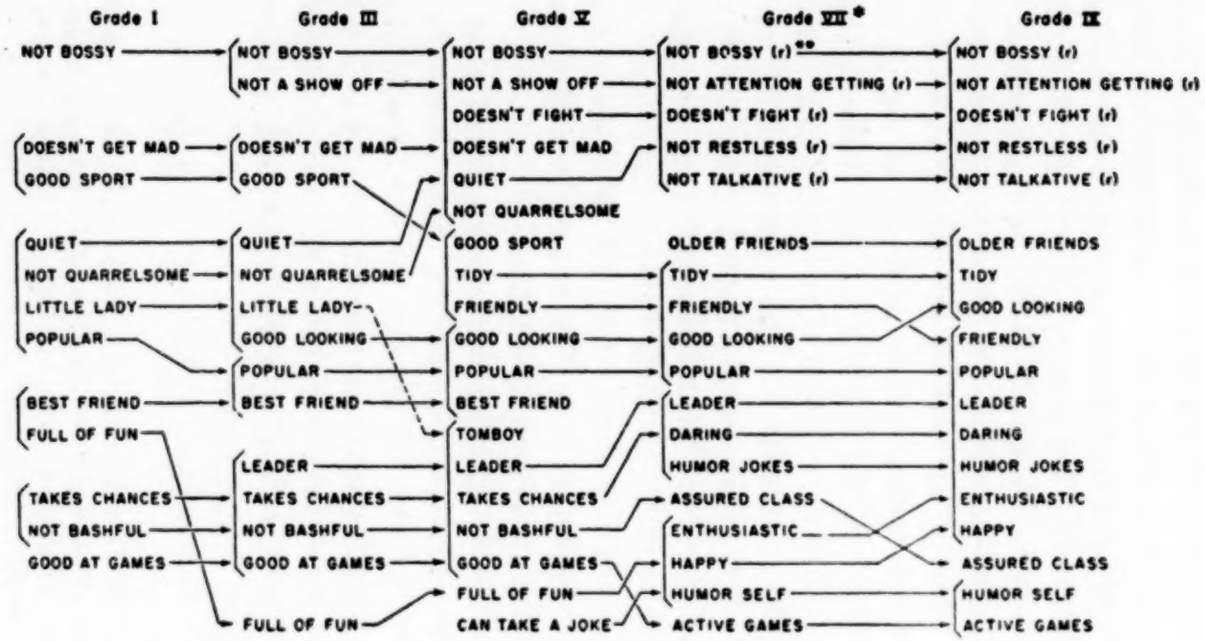
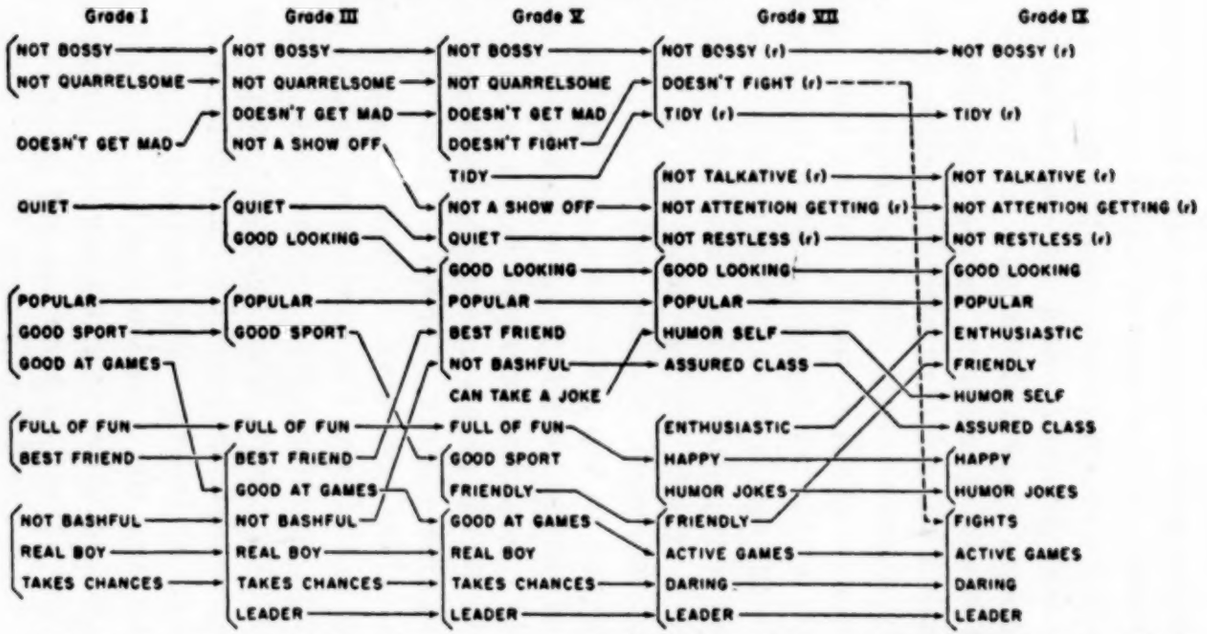


TABLE VIII.—(*Continued*). (BOYS)



* Data for Grades VII and IX from C. M. Tryon.[3] Adapted from Table 7, p. 23, by permission.

** Variables marked (r) have been reflected to make the nomenclature of the two studies consistent.

skill, predicated upon motor coördination, strength, size, and physical maturity. Since the determinants of these latter attributes are in part inherited, the individual boy is faced with the problem of adapting to a pattern which is stable and clear, but which may or may not be attainable, depending upon factors of genetic endowment which are beyond his control. Both group and individual studies reported elsewhere in this series[5,6] suggest that many boys are unable to measure up to the values of the group, and that personal insecurity and social maladjustment often have their roots in this area.

For girls, the situation seems to be very different. In both studies, traits connoting quiet, sedate, unassertive behavior are found to be valued more among girls than boys, and outgoing, dominant, aggressive qualities to be valued less. More significant, however, are the conspicuous shifts in traits regarded as desirable at different age levels. Our own data reveal a fairly stable association of popularity with attractiveness and demure friendliness, but a regular decline with age in the approval accorded to submissiveness, docility, and timidity. The item Little Lady, designed to tap attitudes about femininity, shows the most marked decline of all, from a high correlation with Popular in Grade I to a near zero correlation in Grade V, with Tomboys as likely to win group acceptance as those who persist in the more feminine pattern. Tryon's report indicates this general shift in values goes even further among junior-high-school girls. By age fifteen, the traits most valued are extraversion, leadership, sportsmanship, and activity, which earlier are more significant for boys, although traits connoting heterosexual attractiveness and sophistication constitute an alternative set of values rather unrelated to other desirable qualities. Thus, the individual girl faces the situation that her appropriate social rôle is unclear and continuously undergoing major changes. Although she is less dependent than the boy upon possession of specific physical skills, the demands upon her for flexibility may offer an equal problem in securing group approval.

6. COMMON AND SPECIFIC DETERMINERS OF VARIANCE ON REPUTATION TEST ITEM-PAIRS

Throughout the above discussion we have been interested in the relationships between 'idealized' item-pairs, each of which was

theoretically measured without error and determined only by common components—i.e., components sampled by one or more of the other items of the test. Differences between the pattern of interrelationships determined empirically and the pattern yielded by the factor analysis are usually attributable to the fact that individual variables differ in their percentage determination by common and by non-common elements. Hence one may profitably inquire next about the rôle of these non-common components which also help determine scores on the individual item-pairs of the Reputation Test. In Table IX are presented data on the

TABLE IX.—MEAN PERCENTAGE DETERMINATION OF TOTAL VARIANCE IN REPUTATION TEST SCORES BY COMPONENTS OF VARIOUS KINDS

(Total variance = 1.00)

	Reliability	Communality	Specificity	Error
First Grade				
Girls	.54	.60	−.06	.46
Boys	.54	.54	.00	.46
Third Grade				
Girls	.69	.55	.14	.31
Boys	.73	.61	.12	.27
Fifth Grade				
Girls	.73	.64	.09	.27
Boys	.80	.66	.14	.20

relative weight of common, specific, and error components in determining score variance on the Reputation Test. Since the communalities and even the reliabilities are at best estimations of the true values sought,* only mean coefficients for all item-pairs of the test combined† are reported here.

Table IX has important implications for reputation testing programs. An unexpected finding is that a very low proportion of the total variance is contributed by components which are specific to one or another of the items. It will also be noted that

* The reliabilities used are the corrected split-half-of-judges correlations reported by Tuddenham,[5] Table 10.

† The negative specificity for first-grade girls shown in the table is manifestly an absurd result and can mean either that the communalities were estimated slightly too high or that the reliabilities were slightly too low.

both the mean communalities and the mean specificities increase with age, as a result of reduction in the error variance.

The fact that the specificities increase relatively more than the communalities is probably to be explained on the assumption that the descriptive phrases used in the test questions have sharper and more specific meanings for the older judges than for the younger ones. The fact that as much as fifty-four per cent to sixty-six per cent of the variance on the average item is attributable to components held in common with one or more other items also requires explanation. Two possibilities suggest themselves: first, that some general factor enters into Reputation Test scores on whatever item; second, that the independent dimensions of the test are few and that each is sampled by several item-pairs. The latter explanation is consonant with the finding that only three factors were necessary to account for the observed variance, and that in the higher grades residual variables were few and most items fell into tightly knit clusters.

On the other hand, the fact that at the first-grade level the mean communalities constituted over half of the total variance even though clusters were not well defined, suggests that the hypothesis of a general factor pervading all judgments is partially true, especially in Grade I. Since Popular-Not Many Friends is the only item-pair which for all groups of subjects has positive empirical correlations with all other item-pairs, it seems clear that 'likeableness' as sampled by this item-pair comes closest, on the descriptive level, to constituting a general factor in reputation. Indeed, one may if one chooses, regard the projections of the various item-pairs upon the X or Popular axis as measures of their loading by a sort of reputational 'G.'

These considerations lead the writer to the conclusion that a general factor is most important in accounting for the communalities in Grade I. Indeed, the low specificities and poor clustering of variables in the first grade suggests that at this level the Reputation Test is measuring very little except this general factor. It follows that clinical characterizations of subjects based on a study of scores on individual item-pairs is not warranted for such young children. In Grades III and V, however, the importance of this general factor probably wanes, and the hypothesis of two or three independent dimensions each sampled by several traits becomes a more adequate explanation of the results.

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7. SUMMARY

Intercorrelations based on a population of over a thousand public school children were computed between all the item-pairs of the Reputation Test, separately for girls and for boys in Grades I, III, and V. The resulting six correlation matrices were subjected to factor analysis by the orthometric method of R. C. Tryon. Three factors were found to be sufficient to account for the variance in each of the six sets of data.

The item-pair Popular (i.e., Who are the ones everybody likes-Who are the ones nobody seems to care much about) proved to be the only variable having positive correlations with all other item-pairs in all matrices. It is suggested that over-all liking or disliking constitutes a sort of general factor in reputation among the groups studied. The variables most closely correlated with Popular change from group to group. In most sets of data, however, Good Looking, Friendly, Good Sport, and especially Best Friend (the latter being the variable which actually selects the popular, as opposed to the likeable) tend to have substantial correlations with Popular.

The item-pair Real Boy is consistently associated at all levels in the boys' data with Leader, Good at Games, and Takes Chances. This cluster, emphasizing athletic skill and dominance, appears to define the pattern which is most valued and rewarded among boys.

A second cluster, composed of Quiet, Not a Show Off, Not Quarrelsome, and Doesn't Fight, occurs in both girls' and boys' data but has much less overlap with Popular among boys than among girls, and zero or negative correlation with variables of the Real Boy cluster. However, in Grade V, the boys come to differentiate between reserve (Not a Show Off and Quiet) and submissive docility, Not Bossy, Doesn't Fight, Not Quarrelsome, and Doesn't Get Mad.

The item-pair Acts Like Little Lady, in contrast to the Real Boy variable, changes more in its correlates than any other in the test. In Grade I associated with Popular, it correlates highest in Grade III with the 'unassertiveness' traits (e.g., Not Quarrelsome and Quiet). In Grade V it falls in no cluster and has zero correlation with Popular, although its antonym Tomboy belongs in the cluster with Takes Chances, Daring, etc., which define the approved pattern for boys.

It is suggested that the problem of securing group approval for a boy is one of conforming to a clearly defined group of traits for which he may or may not possess the requisite strength and motor skill. For a girl, the problem is more one of adapting to a continuously changing set of values which are never as clearly defined as they are for the boy.

A table relating the results from the factor analysis of data for Grades I, III, and V to the findings of C. M. Tryon[3] for Grades VII and IX is supplied. In general, the patterns found in the two studies tend to be closely congruent.

Estimation of the proportionate determination of scores by 'common' and by 'specific' components indicates that the rôle of specific components in determining scores on the avèrage test variable is relatively minor compared to the contribution of common and error components. At the first-grade level one may assess a child's general status in his group, but one is probably not justified in attaching much significance to his scores on individual dimensions. In Grades III and V, scores on separate item-pairs may prove useful to the clinician in revealing more specifically how each child is perceived by his peers, and how he can best be helped to achieve good social adjustment.

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METHODOLOGY AND THE TEACHING OF EDUCATIONAL PSYCHOLOGY

JOHN E. HORROCKS

Associate Professor of Psychology
Ohio State University

The past few years have seen considerable discussion as to the function and content of educational psychology in the teacher education sequence. An examination of extant textbooks, committee reports, and conversations with those who teach educational psychology leads to the conclusion that there is not a recognizable pattern in the organization of course. There is considerable disagreement about what content shall be taught, what emphasis shall be placed upon content included, and in what sequence or organization the selected content shall be presented.

For some, a course in educational psychology is conceived of as a course primarily in school learning, for others the organization tends to emphasize mental hygiene, and for still others development and child behavior receive the major emphasis. Most courses tend to include all three—development, learning, and mental hygiene—but with different emphases. Some instructors speak of their approach as sociological and affirm that their emphasis is built around the sociology of childhood. Others are preoccupied with a technology of learning. And still others place emphasis upon a methodology of instruction in specific subject matter areas akin to the old courses in the psychology of the elementary- and secondary-school subjects. Some even characterize their approach as 'philosophical.'

Educational psychology may be presented as a single subject with or without prerequisites, it may be presented as part of an 'integrated' sequence which may involve scattered 'units' of psychological material, or it may be merged completely in a series of integrated or coördinated education courses. It may be taught by anyone from a competent psychologist to a person who has never had a course in psychology himself and who teaches educational psychology because he needs a course to fill his schedule.

In the area of methodology and presentation the picture is as

confused and often as erratic. There appears to be no recognizable pattern of a methodology of presenting educational psychology. Presentation ranges from a straight lecture to an all-out kind of ultra-Progressive project approach. Some courses are centered around problems or case studies and some around the memorization of research studies. Some emphasize a single textbook, some dispense with a textbook altogether, and some have several. One instructor will make great use of collateral reading, another will not. Visual aids and demonstrations form an important part of presentation in some courses, while in others they never make their appearance. Further, there appears to be little or no agreement about the inclusion of field trips and various kinds of practicum experience.

This lack of agreement about methodology of presentation is neither strange nor even, necessarily, undesirable when one takes into consideration the varying objectives and content of the different courses, the disparity in equipment and support which the course receives from its college, the field facilities available, and the individual differences of the instructors involved. It goes without saying that what will work with one instructor and one type of course may not work with another instructor or another type of course. It seems to the writer, however, that all those who teach educational psychology have a common responsibility, and that is to make the presentation of their course as vital and efficient as they possibly can; and above all, to base their presentation upon some of the principles and applications that they preach in their courses. It is indeed an anomaly for those students who sit day after day in a course in educational psychology to find the very things that the instructor is preaching or advocating violated in his own presentation, or to find him failing to use the most effective methods and technical knowledge of his own subject as he tries to inculcate its principles and applications in his students. It is optimistic to believe that students will have much respect for educational psychology or, what is more important, that they will make use of it in their own teaching when they have seen an 'expert' who definitely does not find it necessary to practice that which he expounds, or to make any valid use of good educational psychology in his own teaching.

Over all is the feeling that educational psychology is an exceed-

ingly vital thing in education and instruction, and it is the duty of educational psychologists to make very certain that their subject will make a contribution to the understanding and future teaching proficiency of the students who take the course. Every course in educational psychology could well be a demonstration center and a laboratory in good teaching and learning practices. In effect, the instructor should be saying: "See! This is how it is done. This is how this or that principle may be applied in an actual classroom situation."

At the Ohio State University considerable time and effort is routinely spent upon the methodology of instruction in educational psychology. New methods of presentation and classroom application of psychology are being tried, some in the form of experiments with the usual controls, and some more or less empirically in order to find ways and means of instruction which may later be submitted to experimental analyses if they appear to be promising.

As the course in educational psychology is presently organized at Ohio State the emphasis is upon coöperative learning and a socialized type of recitation which places considerable responsibility on the student. The instructor is regarded as a service person who is available to facilitate learning, answer questions, set problems, guide discussion, keep the course moving along, and who generally acts as a sort of classroom factotum. He does not attempt to dominate the classroom and he does not deliver lectures. He does not assign a chapter in a textbook and stand before his class the following day and regurgitate in outline form what they have read as well as he. He does not talk so much that no one else in the classroom has an opportunity to say anything. He does not expect students to sit with open notebooks copying down what he says. He does not spend his time firing direct questions at the class to see if they have read a given assignment. He does not administer a long series of factual examinations which are neither applicational in nature nor learning experiences for the students who take them.

He does try to make himself a part of the class, he does try to guide learning, he is there to help when he is needed, and he does consciously try to apply in his classroom the principles and applications of educational psychology. He does believe that learning is an active process and that students must assume an

active and responsible part if their learning is to be efficient. He is convinced that a knowledge of fact and principle does not mean an ability to apply such facts and principles in a complex situation. He feels that an instructor who dominates a learning situation may do more harm than good. He believes that in the final analysis the success of his course depends more upon what his students apply in their own future teaching than what they say and do in his class. In short, his function is primarily that of a service person who allows the students to assume a responsible and active part in their own learning.

As a means of achieving these ends the Ohio State course in educational psychology is based around two major points of methodology, committee work and general discussion. At Ohio State classes in elementary psychology ordinarily contain either thirty-six or forty-two students, usually the former.* At the beginning of the course the class is divided into committees of six each, and a chairman is elected for each committee. This is the major learning unit in the classroom and each committee works together throughout the course. The classroom contains a number of separate tables seating six persons each and arranged around the periphery of the room. The center, or sometimes one end, of the classroom is occupied by a group of regular desk type armchairs arranged facing each other in the form of a hollow square so that when a general discussion occurs all students face each other and everyone can be heard. In this way there is no arrangement which places the instructor in front of the class. He takes a vacant chair (always a different one if possible) some place in the square after the class is seated. Thus there is no front of the room and no opportunity for the instructor to assume a dominating position.† Classwork, then, is carried

* The matter of class size does not appear to be a particularly important factor where actual learning is concerned under the approach described in the present paper. Equal results, on our objectives, have been obtained with classes ranging from eighteen to one hundred thirty-six, but thirty-six is preferred since that number or one close to it permits adequate general discussion, and allows the instructor to know his students better and to keep more closely in touch with what they are doing. This last is true also with a smaller number, but it is good administrative practice to place as many students in a section as can be taught effectively.

† When the writer accompanies a visitor to one of the classes where a general discussion is taking place it is sometimes interesting to ask the

on mostly at the committee tables with the instructor circulating freely about, listening in or directing work at the different tables, and occasionally sitting at a table in order to enter a committee discussion. There is also a class steering committee which helps the instructor with planning the work for his section and with administrative detail generally. The steering committee may assume various activities or functions, such as responsibility for a series of class bulletins, the organization of a class social affair, attendance, etc. The steering committee, which has its own chairman, consists of one representative from each table committee. Ordinarily the steering committee members work during class with their own table committees since the steering committee is an administrative, not a learning, committee.

When a general discussion is called for, the whole class assembles in the discussion square. In a smaller classroom than ours the students might carry on their discussion from the tables, although it has been found that the discussion goes more smoothly and is more audible from the square than when they remain at their tables. When a long motion picture is shown or an outside speaker or demonstration is used the class usually meets in a central visual-aids room where several sections may meet together.

The foregoing, then, describes the organization of the class. What is done with the committees and how they work is something that varies from section to section and depends on the instructor and what he is trying to accomplish. One typical procedure is that of assigning readings or a problem for the class to do overnight. The next day at the beginning of the class period each committee meets to discuss what has been done with the assignment and to decide what aspects or questions it will wish to bring up in general discussion. The committee meetings for this type of material usually occupy the first twenty minutes of the hour, and the instructor occupies himself during that time by visiting each committee in turn in order to note the trend of the discussion. The same procedure is often employed when a case study is to be discussed, or when an examination has been taken.

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visitor if he can identify the instructor who is, of course, occupying a seat in the group square and actively participating in the discussion. The record to date has been twenty-five minutes.

On the day following an examination it is the custom of the class to discuss the examination as a learning experience. On such a day the period begins with the various committees discussing the examination at their tables and helping each other with items which members have answered incorrectly, and deciding as a group what specific questions and what aspects of the examination they wish to bring up in general discussion. This acts as a means of saving time, since items that are missed by only a few people are usually explained within the committee group, and large group time is reserved for questions which at least six people have decided are worthy of general discussion. Such a technique serves the further purpose that very frequently the general discussion tends to emphasize educational and psychological implications of the questions and may serve as a springboard into the next section of the course. In any event, the post-examination sessions do not degenerate into the usual arguing contest between the instructor and students who have failed a given item while the rest of the class sleeps or gazes out the window. The same thing is true of general discussion on assigned readings and problems, where many minor points are ironed out in committee discussion, and more major aspects are left for the limited time available for the general discussion. In this manner, also, students tend to assume a responsible part in class planning as they decide in the committees what aspects of the assignment need discussion.

The committee sessions are generally accepted as a learning opportunity. It frequently happens that brighter students or students with more background gain their initial experience in teaching others when they endeavor to help slower members of their committees. A good example of the committee as a place of learning and mutual help occurs during a unit on statistics which comes in the first days of the course at Ohio State. The statistics unit involves an understanding of frequency tables, graphs, charts, and the meaning of correlation. It also involves learning to compute means, medians, and percentiles from grouped data. The purpose of the unit is to enable the student to read and understand graphs, tabular materials, and simple statistics such as he is likely to encounter in his reading in educational psychology. It is also intended to show means and ways of manipulating and reporting quantitative data. Materials

for the statistics unit comprise three instruction sheets explaining the content of the unit and several computational work sheets, all of which are given to each class member. From that point on the entire work of the unit, both learning and computational, is carried on in the committee groups. The instructor does not lecture or discuss statistics with the class as a whole. His job during that period is that of overseer. At the committee tables the students begin by working independently for a time, but soon begin to check each others work and help each other when a difficulty is encountered. During this period slower students receive considerable help from students at their table who grasp the work more quickly. After two, or at most three, class periods a computational and multiple choice examination on statistics is administered. It is understood that those students who do not reach a minimum level of proficiency as evidenced by the examination must take a similar test again on their own time until they do reach such a minimum level. Hence, during this unit the students have learned statistical techniques and understandings among themselves without having to rely on the instructor.

The statistics unit also acts as an 'ice-breaker' in that it accustoms students to work together in committees and shows them the possibilities of coöperative learning. As is the custom in the course, the mechanics and implications for school learning of what they have done is explained to them, and it is pointed out that they may try similar ventures in their own teaching. A conscious effort is being continually made by the instructors in the course to use the class itself as a learning and demonstration laboratory. Instructors continually explain why they are doing what they do and how it fits into good learning theory and practice.

Sometime after the statistics unit is completed the class decides how long they wish to spend working in committees as compared to general discussions during each period. The allocation of time will vary from section to section, and will vary within a section, depending upon the task to be accomplished. Occasionally a committee will wish to work together the entire period and dispense with the general discussion on a given day. On other occasions the students will prefer to subordinate the committee discussion in favor of a longer general discussion.

The committee system also lends itself to research and various homogeneous grouping schemes. Sometimes committees may consist entirely of the academically more able; sometimes a special interest group will work together.

The organization of the committees has so far been a matter of some discussion among our staff, although it is agreed that no one scheme of organization will serve every occasion equally well. Sometimes the committees are selected by the instructor, sometimes six people work together who wish to do so. Sometimes the same committee will work together for the entire term and sometimes a rotation policy is adopted.

One of the more interesting experiments which has been tried is that of requesting each committee to function for the first two or three weeks before they elect a chairman. During the pre-chairman period the instructor is supplied with an interesting opportunity to study the emergence and development of leadership in a small group. After the chairman has been elected and has functioned for several weeks, all committees are reshuffled, the previously elected chairmen of the old committees being placed together on one committee in order that the emergence of a leader from a group of leaders may be observed. This is, of course, only one of the many possibilities inherent in the committee system. Another possibility is the opportunity to do something to help improve students' social adjustment. Sociometric analyses are routinely made at two-week intervals throughout the term and students may be reallocated on committees in terms of sociometric position, with particular reference to isolates.

The foregoing discussion about socialized and group recitation, committee organization, and the acceptance of student responsibility in the teaching of educational psychology has not been advanced as a panacea for learning. Nor has it been advanced as the only or even the most desirable means of teaching educational psychology. It has been made as a suggestion of method that has shown promise in terms of students' attainment of the objectives set for the course. There are, of course, numerous other methods attainable for other types of objectives.

THE RELATION OF SEX, AGE AND SCHOOL ACHIEVEMENT TO LEVELS OF ASPIRATION*

LOWELL M. WALTER
University High School
University of Illinois

and

STANLEY S. MARZOLF
Professor of Psychology
Illinois State Normal University

The principal purpose of the present study was to discover to what extent there are sex differences in level of aspiration. Previous studies have indicated that sex differences may occur, but the data are in some cases ambiguous. The influence of other factors has not been investigated sufficiently, and therefore differences in age and scholastic achievement have been taken into account in the present study.

METHOD

The measuring instrument used in this study was comparable in all essential respects to the 'aspiration board' developed by J. B. Rotter.[1] This task has been proven valid in previous experiments concerned with levels of aspiration and appears to be equally novel, at all age levels, for the members of both sexes.

Eighty subjects were used. All were pupils in the laboratory schools at Illinois State Normal University. Ten boys and ten girls were selected at random from each of the following grades: fourth, sixth, eighth, and twelfth. An equal number of boys and girls were taken from each grade to facilitate statistical analysis of differences between the sexes and the various grade levels.

Each subject was tested individually without any knowledge

* Based upon portions of a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Education, Illinois State Normal University.

[1] J. B. Rotter, "Levels of Aspirations as a Method of Studying Personality." *J. Exper. Psycho.*, XXXI, 1942, pp. 410–422.

of the performance of other subjects. The following instructions were given to each subject:

"This has nothing to do with your class work. It is a skill test to find out how well you can perform a task you have never done before. The idea is to try to hit this ball in such a way that you will make it stop at the 10 each time. Your score will be the number where the ball stops. I will allow you to practice for awhile before we start to measure how well you can actually do."

After the instructions the subjects were allowed to have three practice trials consisting of five shots for each trial. This practice period enabled the subject to find the best way to hold the cue stick and to determine approximately how much force should be used to hit the ball and obtain the best results. The instructions were then continued: "You know that if you hit the ball five times and make a score of ten each time your total score will be fifty. Each time I want you to make as high a score as you possibly can. That is the only way to improve your game. What score do you think you will make on the next five shots?"

The subject then made a statement of the score he expected to achieve. After this score was recorded the subject took his five shots which comprised the first experimental trial. The actual performance score was then reported to the subject and he was informed of the difference between his performance score and the score he thought he would make. He was then asked to state what he thought he would make on the next five shots, or next trial. The same procedure was followed for each of the twenty trials constituting the test.

If the subject did not fully understand the instructions he was permitted to ask questions. The experimenter illustrated how to hold the cue stick where necessary, but he was careful to avoid any indication that the estimate of future performance was more significant than the actual performance itself.

A series of twenty trials and estimates of the level of future performance following each trial were recorded for each individual. The difference between the level of past performance and the estimate of the level of achievement for the next performance provided data for the study. These twenty discrepancy scores thus obtained for each individual were added together to provide the total goal discrepancy score for each subject.

In order to study any differences which might exist between

subjects who were good students and those who were poor students, results were obtained from achievement tests which had been recently administered to these subjects. The *Metropolitan Achievement Test* had been administered to grades four and six, the *Stanford Achievement Test* to the eighth grade, and for the twelfth-grade students test results were obtained from a battery of tests used in a state-wide high-school testing program. Since the results of these tests are not comparable on a centile basis, the subjects in each of the four grades were divided into those who scored above the median of their group and those who scored below the median of their group.

RESULTS

The goal discrepancy scores obtained by boys and girls are shown in Table 1. It is at once apparent that, on the average,

TABLE 1.—GOAL DISCREPANCY SCORES OBTAINED BY BOYS AND GIRLS. ALL GRADES

Score	Boys	Girls
220– 239		1
160– 179	1	
140– 159	3	
120– 139	1	1
100– 119	1	2
80– 99	1	
60– 79	8	1
40– 59	9	9
20– 39	8	6
0– 19	5	4
−20– −1	3	3
−40– −21		5
−60– −41		5
−80– −61		1
−100– −81		1
−180– −161		1
Total	40	40
Mean	55.50	14.00
Standard Deviation	44.72	66.85

boys had higher goal discrepancy scores than the girls, for the mean goal discrepancy score for boys is 54.55 and for girls, 14.525. The difference between these means is significant at the one per cent level. ($t = 3.14$.) It is also apparent that the

TABLE 2.—GOAL DISCREPANCY SCORES OBTAINED AT FOUR GRADE LEVELS

Score	Grade			
	12	8	6	4
220– 239	1			
160– 179	1			
140– 159		2	1	
120– 139	2			
100– 119		3		
80– 99			1	
60– 79	3	4	1	1
40– 59	3	5	4	6
20– 39	4		7	3
0– 19	2	2		5
−20– −1	1	1	3	1
−40– −21		3	2	
−60– −41	2			3
−80– −61	1			
−100– −81				1
−180––161			1	
Total	20	20	20	20
Mean	49.00	54.00	23.00	13.00
Standard Deviation	71.97	53.9	60.09	42.08

range of scores for girls is considerably greater than that for boys, for the standard deviations are 66.85 and 44.72, respectively. The ratio between the variance for girls and that for boys is 2.24, which is significant at the one per cent level. ($F = 2.24$.)

The distribution of goal discrepancy scores for each of the four grades used in this study are shown in Table 2. It is apparent that the mean goal discrepancy scores for the eighth- and twelfth-graders are higher than the mean scores for the fourth- and sixth-graders. Rather than analyze the between-grade variance as presented in this table, the data are arranged in a form to facilitate a more complete analysis and presented in Table 3. In this table we note the sex and grade difference in mean scores shown in Tables 1 and 2.

TABLE 3.—TOTAL AND MEAN GOAL DISCREPANCY SCORES OF THE SEXES AT EACH OF THE FOUR GRADE LEVELS

Grade	12th		8th		6th		4th		Mean
	Total	Mean	Total	Mean	Total	Mean	Total	Mean	
Boys	650	65.0	771	77.1	441	44.1	320	32.0	54.55
Girls	295	29.5	293	29.3	24	2.4	−31	−3.1	14.525
Mean		47.25		53.20		23.25		14.45	34.5375

Analysis of the total variance yields the following results:

Source of Variance	d. f.	Sum of Squares	Variance
Sex	1	32,120.1125	32,120.1125
Grade Level	3	20,816.2375	6,938.7458
Sex x Grade	3	530.2375	176.7458
Within Group	72	233,091.2925	3,237.3791
	79	286,557.8800	

Since the interaction variance is less than the within-group variance, it is neither significant nor does it provide a reliable basis for evaluating the variance due to other sources. When sex variance is compared with the within-group variance an *F* of 9.92 is obtained, which is significant at the one per cent level. The variance due to grade level yields an *F* of 2.14, which is not significant at the five per cent level.

As outlined at the outset, the pupils in all grades were divided into two groups, those above and those below their respective grade medians in achievement. Tabulation of the goal dis-

crepancy scores for the high and low achievers in each grade is to be found in Table 4. The grade means, of course, remain the same as shown in Table 3. The mean goal discrepancy score of all pupils who are above their grade medians in achievement is slightly lower than the mean for all who are below their medians.

TABLE 4.—TOTAL AND MEAN GOAL DISCREPANCY SCORES OF THOSE ABOVE AND BELOW THE MEDIAN ACHIEVEMENT AT EACH OF THE FOUR GRADE LEVELS

Achievement	Grade								Mean
	12th		8th		6th		4th		
	Total	Mean	Total	Mean	Total	Mean	Total	Mean	
Above Median	228	22.8	553	55.3	422	42.2	99	9.9	32.55
Below Median	717	71.7	511	51.1	43	4.3	190	19.0	36.525
Mean		47.25		53.2		23.25		14.45	34.5375

Though the difference between these means for all students is slight, in the twelfth grade this difference is very large. There is also a large difference in the fourth grade. Contrariwise, in the sixth and eighth grades the mean goal discrepancy score of those above the median achievement score is higher than that for those below the median, but only in the case of the sixth grade is the difference of any size. These observations suggest the possibility of a significant degree of interaction variance.

Analysis of the total variance into four parts yields the allocation of variances shown below:

Source of Variance	d. f.	Sum of Squares	Variance
Achievement	1	316.0125	316.0125
Grade Level	3	20,816.2375	6,938.7458
Achievement × Grade Level	3	19,324.3357	6,441.4452
Within Groups	72	246,101.2943	3,418.0735
	79	286,557.8800	

It is quite apparent that neither the variance due to achievement differences nor that due to grade differences, already shown to lack significance, is significantly greater than the interaction variance. The possibility of significant interaction variance is not borne out, for the ratio of interaction variance to within-group variance is only 1.89, whereas an F of approximately 2.74 is required for significance at the five per cent level.

SUMMARY AND CONCLUSIONS

The diverse findings may be summarized as follows:

1) In general, the goal discrepancy scores of boys are higher than those made by girls. (One per cent level)

2) Girls' goal discrepancy scores cover a wider range than do those of boys. (One per cent level)

3) Though the mean goal discrepancy score varies from grade to grade, the variance due to grade level is not significant at the five per cent level.

4) Though there are marked differences in mean goal discrepancy scores, particularly in the twelfth, fourth, and sixth grades, between those above and those below the median achievement level of their grade, these differences are not significant. For the fourth and twelfth grades those below the median in achievement have a higher mean goal discrepancy score, while in the case of the sixth grade the difference, though large, is reversed. However, this apparent interaction did not prove to be statistically significant.

The fact that level of scholastic achievement has so little effect upon goal discrepancy score, or level of aspiration, may come as somewhat of a surprise. However, these data indicate that academic achievement is not as potent an influence as we may have thought.

The principal conclusion is that, for the age range studied, there is a significant sex difference in level of aspiration. In general, boys feel a greater need for achievement and thus obtain high goal discrepancy scores. Though the task may possibly have produced greater ego-involvement for boys than for girls, overt behavior of the subjects gave no such indication. In view of the possibility that the task used in this study may not have been equally valid for girls and boys, there is justification for a similar study using a different task.

The sex difference found is probably a consequence of our school system and of our culture. The fact that the school is more likely to reward the feminine virtues of docility and submissiveness has frequently been noted. If such be the case, boys may generally have more of their behavior go unrewarded, be more frequently frustrated, and consequently set higher aspiration levels. Whatever the explanation, the sex difference seems well established for the conditions of this study.

HOSTILITY, COMMUNICATION, AND INTERNATIONAL TENSIONS: III. THE HOSTILITY FACTORS

HARRY A. GRACE AND GLORIA LAUER GRACE
University of Illinois

INTRODUCTION

In earlier research conducted by one of the authors on the expression of hostility[1,2] analyses of variance indicated that the three fields of human behavior studied were very similar, and the four categories of hostility very different from each other.

Since the basic design was similar to that of Rosenzweig,[4] it was assumed that the major expressions of hostility were against the self, against others, and impunitive or *laissez faire*.

The subjects previously studied were teachers. In order to conduct a similar experiment a new 'professional' field was created to fit situations.

METHOD AND PROCEDURE

A verbal inventory was made consisting of the twenty-three items which were demonstrated to be most discriminating on the original inventory in both the everyday and international fields. In addition twenty-three student situations were randomized throughout the inventory.

This sixty-nine item test was administered to one hundred thirty-five undergraduate college students at the University of Illinois in early spring 1949. It was readministered to the same group two months later.

RESULTS

Item Analysis.—(Table I) The highest and lowest twenty per cent of the subjects in each field and category were compared with reference to each item. Those items which did not discriminate were discarded. Nine items remained in each field, or a total of twenty-seven items for the inventory.

Reliability.—The test-retest method for studying reliability was employed. The score for each subject in each of the field-categories on the test was correlated with his score on the retest. (Table II.) The correlations run from .52(EA) to .77(IA).

TABLE I

EA	Everyday autohostile; everyday situations, blames self.
EL	Everyday *laissez faire;* everyday situations, no one blamed.
EV	Everyday verbal-heterohostile; everyday situations, verbally attacks agent.
ED	Everyday direct-heterohostile; everyday situations, physically attacks agent.
SA	Student autohostile; student situation, blames self.
SL	Student *laissez faire;* student situation, no one blamed.
SV	Student verbal-heterohostile; student situation, verbally attacks agent.
SD	Student direct-heterohostile; student situation, physically attacks agent.
IA	International autohostile; international situation, blames self or own nation.
IL	International *laissez faire;* international situation, blames no one.
IV	International verbal-heterohostile; international situation, verbally attacks other nation.
ID	International direct-heterohostile; international situation, directly attacks other nation.

TABLE II.—PRODUCT MOMENT CORRELATIONS OF THE RAW SCORES FOR 135 SUBJECTS ON THE TEST AND RETEST

EA	.52	SA	.59	IA	.77
EV	.72	SL	.70	IL	.66
EL	.61	SV	.57	IV	.72
ED	.60	SD	.55	ID	.56

Factor Analysis.—The subjects' scores on each field-category were correlated with the scores for each other field-category. The correlation matrix is given in Table III.

The matrix of intercorrelations was then factor analyzed by means of the centroid method.[5] The factor loadings of the six factors obtained are presented in Table IV.

DISCUSSION

Reliability.—Each of the correlations representing the reliability of the respective field-categories exceeds .50. This indicates a test of fair reliability. In all probability the reason for the correlations to be no higher is that the fields and categories

TABLE III.—MATRIX OF INTERCORRELATIONS

	EA	EL	EV	ED	SA	SL	SV	SD	IA	IL	IV	ID
EA		−.138	−.556	−.272	.390	.086	−.185	−.054	.099	−.039	−.033	−.074
EL			−.663	−.479	−.021	.465	−.373	−.295	.237	.065	−.307	.113
EV				.248	−.224	−.284	.409	.161	−.236	.039	.217	.064
ED					−.162	−.287	.249	.390	−.177	−.159	.255	.241
SA						−.372	−.181	−.298	.317	−.071	−.204	−.199
SL							−.713	−.322	−.183	.390	−.147	−.084
SV								.037	.059	−.291	.191	.102
SD									−.162	−.189	.261	.275
IA										−.419	−.515	−.402
IL											−.425	−.282
IV												.230
ID												

are not as distinct as were previously supposed. The factor analysis indicates some complex inter-relationship among field-categories which tends to lower the reliability for individual field-categories. A person may score within the same factor on the test and re-test, and the reliability of the subtest will be adversely affected. In order to build a more reliable instrument an inventory would have to be constructed along the lines of the general factors indicated.

Factor analysis data.—The fruitfulness of treating data as complex as these by more than one statistical method seems to

TABLE IV.—FACTOR LOADINGS OBTAINED BY THE CENTROID METHOD

	I	II	III	IV	V	VI
EA	−.344	+.393	+.090	−.383	+.396	−.212
EL	−.575	+.138	+.340	+.443	−.357	+.312
EV	+.648	−.441	−.364	−.253	−.270	+.230
ED	+.597	−.069	−.044	+.103	+.269	−.059
SA	−.334	+.356	−.380	−.418	+.227	+.196
SL	−.486	−.567	+.562	+.103	−.160	−.140
SV	+.595	+.217	−.410	+.085	−.236	−.153
SD	+.498	+.065	+.215	+.061	+.375	+.176
IA	−.351	+.360	−.417	+.342	+.074	+.028
IL	−.291	−.705	−.066	−.012	+.192	+.079
IV	+.580	+.105	+.421	−.365	−.152	−.354
ID	+.394	+.168	+.441	−.022	−.122	+.259

be clearly indicated. Whereas on the earlier study[1] the analyses of variance indicated the similarity of fields and the distinctness of categories, the factor analysis clearly demonstrates the complexities of the subgroup interaction. The factor analysis further challenges some of the assumptions raised in earlier studies.[1,3,4]

Factor I.—The positive loadings tend to be higher in this factor and include everday, student, and international verbal- and direct-heterohostile scores. In the negative aspect of this factor are everyday, student, and international autohostile and *laissez faire* scores.

Factor II.—The negative loadings tend to be higher in this factor and include everyday verbal-heterohostility and student and international *laissez faire* responses. The positive loadings

include the everyday, student, and international autohostile field-categories.

These two factors appear to be the most general of the six studied. Considered together they form a unit. Factor I indicates a general expression of hostility. The subjects tend to be hostile toward others in all of the fields studied. Polar to this, subjects tend to express hostility against themselves or fail to express hostility in all of the fields. The tendency for the subjects studied to be hostile toward others remains stronger. In Factor II we also have a general expression of hostility. One pole of this factor indicates the tendency for subjects to refrain from expressing hostility in any clear direction in their vocational and international rôles, whereas they tend to be verbally hostile toward others in everyday situations. This tendency appears to be stronger than the other pole which suggests that some subjects are hostile toward themselves in all situations.

Factor III.—The positive factor loadings are higher here and include everyday and student *laissez faire* and international verbal-and direct-heterohostile field-categories. The negative factor loadings include every day and student verbal-heterohostility and student and international autohostility.

Factor IV.—The negative factor loadings are higher in this factor and are composed of everyday and student autohostility and everyday and international verbal-heterohostility. The positive factor loadings include the everyday *laissez faire* and international autohostile field-categories.

Factors III and IV indicate a tendency toward the displacement of hostility for the subjects under consideration. In Factor III we find that subjects who do not clearly express hostility in their everyday and professional lives tend to be very hostile toward other nations when such situations arise. Polar to this and not as frequently we find that persons who are verbally hostile toward others in their everyday and some vocational rôles tend to be self-hostile in international and some vocational problems. The loadings in Factor IV suggest that persons who express hostility against themselves in everyday and vocational situations tend to be verbally hostile toward others when it comes to international and some everyday problems. This is a stronger tendency than the one polar to it. On the other hand, subjects who do not express hostility in a definite manner in everyday events tend to blame their own nation in international incidents.

Factor V.—In Factor V the positive factor loadings are higher and include everyday and student autohostility and direct-heterohostility. The negative loadings are composed of the everyday *laissez faire* and verbal-heterohostile field-categories.

This factor indicates a dichotomy between mean and extreme expressions of hostility. There is a greater tendency for persons to blame themselves or attack others in everyday and professional problems than there is for them to refrain from any expression of hostility or acting verbally hostile in everyday situations.

Factor VI.—The factor loadings here are fairly equal in strength. The positive loadings include everyday *laissez faire* and verbal-heterohostility and international direct-heterohostility. The negative loadings are composed of the everyday autohostile and international verbal-heterohostile field-categories.

There is no predominance of either pole in Factor VI. On the one hand, there are students who are verbally hostile toward others or express no clear direction of hostility in everyday problems and are directly hostile against other nations, and on the other hand, there are those who blame themselves in everyday events and are verbally hostile toward other nations.

CONCLUSIONS

The factor analysis which was performed on the results of this hostility inventory has clearly demonstrated the complex dynamics involved in the expression of hostility in human affairs. No one generalization is sufficient to explain these phenomena. Each of the conclusions which follows is interdependent upon the others. These conclusions refer to the sample studied, but for practical purposes may be accepted as general until further evidence is gathered.

1) There is more of a tendency for persons to be hostile toward others in human affairs than to refrain from hostility or to be self-hostile.

2) People tend to blame themselves less frequently than they tend to react in a *laissez faire* manner. However, self-hostile persons tend to react the same way in all fields, whereas *laissez faire* persons may show some verbal hostility toward others in daily events.

3) There is a tendency for persons reacting in a nonchalant manner to daily and vocational frustrations to react in an extremely hostile manner toward other nations. Persons acting verbally hostile toward others in daily and some professional situations tend to blame themselves in some professional situations and their own nation in international problems. (a) Displacement of aggression occurs from the common situations to the more distant. This suggests certain problems of the immediacy of retaliation, autistic hostility and identification with symbols of the nation. (b) Self-aggression is tolerated in international situations when the individual freely expresses verbal hostility toward others in common situations. (c) Professional (student) situations are distinct in that self-aggression and verbal hostility toward others is expressed. Sometimes it is propitious to speak out, (against peers, in the absence of authority, in the competitive school situation), and at other times (in the presence of authority, silently to one's self) to vilify one's self.

4) Persons who blame themselves for professional frustrations tend to displace their verbal hostility onto other nations. Those who are *laissez faire* in daily situations blame their nation for international incidents. (a) Self-hostility and verbal hostility toward others seem to be called for in daily situations. (b) Those who tolerate inconveniences in their daily lives feel that their nation should do so in world affairs.

5) There is a tendency for persons to be bi-polar in their expressions of hostility in daily and vocational affairs. Some act in a more normal (statistically defined) manner by not expressing hostility or by doing so verbally toward others.

6) Those who are directly hostile against other nations tend to be verbally aggressive or *laissez faire* toward others in daily events. Persons verbally hostile toward others internationally are self-hostile in daily events. (a) People tend to be hostile toward other nations. (b) The greater the hostility toward others in daily events the greater the hostility toward other nations.

In some cases, the control of hostility toward others in common situations results in the displacement of hostility onto other nations, while in other instances the expression of hostility toward others in common situations increases the expression of hostility toward other nations. Therefore, both the expression and

repression of hostility in everyday affairs are related to the expression of hostility to other nations in international affairs. Further evidence will be necessary before we can identify the situations which elicit a specific type of behavior. At present the educator is at a loss to choose between expression and inhibition of hostility as it may affect international tensions.

SUMMARY

1) A verbal hostility inventory was twice administered to one hundred thirty-five undergraduate college students. After an item analysis was made nine items in each of three fields of behavior remained.

2) The test-retest reliability correlations range from .52 to .77. The reliability is adversely affected by the factors into which the subtests cluster.

3) A factor analysis was made by means of the centroid method. The factors indicate that: (a) A phenomenon of hostility does exist. (b) The expression of hostility is explainable only when both learning and displacement theories are considered. (c) The subjects tested tended to be hostile toward others. (d) Hostility tends to be expressed either in an extreme manner (against the self and directly against others) or in a more moderate manner (verbally against others and against no one in particular).

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A FOUR-PHASE LEARNING PROJECT IN TEACHING EDUCATIONAL PSYCHOLOGY IN COLLEGE

D. R. STONE
Utah State Agricultural College

INTRODUCTION

We who teach courses in the field of education in college are often guilty of not practicing what we teach. That is, we speak of motivation for interest, provision for individual differences and pupil activity, while our classes are by reputation dull and routine, with pupils playing a very passive rôle. Instead of being examples, we merely lecture on what should be done.

In an effort to improve this condition, a project was organized to give students an active part in learning educational psychology. Transfer to real-life experience was sought by basing this experiment on four basic steps in problem-solving procedure, (1) raising issues and problems through an oral-question period, (2) research, (3) organization of data, and (4) presentation of findings. Thus, the emphasis was not only on learning subject matter, but also in giving the student experience in personal problem-solving activity similar to that in actual teaching. Also, as will be seen, it gave practice in working and planning coöperatively.

PROCEDURE

Preparation.—The instructor as a first step reviewed several prominent texts in educational psychology to develop a composite outline of topics. The ten selected were (1) Physical Growth and Health, (2) Abilities, (3) Interests, (4) Emotional and Social Development, (5) Moral and Aesthetic Standards, (6) Learning: General Theory, (7) Learning: Appraisal and Direction, (8) Learning: Applied to Specific Subjects, (9) Understanding the Individual, (10) Psychology of Organization for Total Development.

The second step was to make a list of all the related reference journals available in the library. This came to ninety-five sources.

Organization.—On the first day of class, ditto copies of the ten topics were passed out to each of two classes in educational

psychology. Also provided were a calendar and a step-by-step list of general activities. (Each class met for five days per week for ten weeks.) At that time students signed for the topics of their choice, up to a certain membership limit in each topic, depending on class size. Group I had thirty-seven members with three to five in each topic. Group II had fifty-two members with five to eight in each topic.

In general, each student also signed for two reference journals as his personal responsibility. Some adjustments in signing for journals were made in the case of special interests, and to balance the number of references to the number of students. The instructions then were:

Each group will function as a committee to be responsible for bringing to the class all the ideas and information you can find about your topic. Your work will be divided into four phases:

(1) The Question Phase: Your committee will take its turn answering questions on your topic as a panel in front of the class. The purpose will be for us to raise issues pertinent to your subject, which you may use as a guide in your later work. It will also give you the opportunity to see what subject matter is, in general, related to your topic.

(2) The Research Phase: The next step is to scan the articles in your journal reference, for a five-year period, (one group took 1950 through 1946, the other took 1945 through 1941). Write, on a sheet of typewriter size paper, the title, author, journal name, year, volume, and page number of every article which you feel (after having listened to all topics in the question phase), pertain to any of the ten topics. The research limits will be either one hundred articles per source or a coverage of the five-year period, whichever is less. On the appointed day, bring these to class and pass them out to the appropriate committees. They, in turn, will give to you articles pertaining to your subject.

(3) The Writing Phase: In meetings during the above research period, plan for writing up your material by meeting and developing an idea outline, assigning each member a part. This may be enlarged from day to day as you receive new articles. Then, relate your articles to the idea outline by making a research outline, in which you organize and write annotations of selected articles. Arrange to have one hundred copies of your committee's completed work printed. (The supply list for the class required two stencils and one hundred copies of each for each student.)

(4) The Report Phase: At the scheduled time, be prepared to report your findings as a panel to the class.

The above events were then scheduled, day by day, for each of the ten committees. In a ten-week period, fifty days were available. Allowing two days for organization, and ten days for each of the four phases, eight days were left for special events, holidays, and examinations.

RESULTS

Phase One.—During the question period, the group for each topic sat facing the class. This part of the project was text-oriented, and each committee was instructed to have read the text thoroughly as a basis for answering questions. They were instructed also to keep notes on the questions that seemed to develop most class interest.

An average of thirty-two per cent of the smaller group (of thirty-seven) participated as questioners, while the percentage was twenty-four of the larger group (of fifty-two). The instructor asked questions to change the subject an average of eight times per session. This became desirable in order to introduce some of the main points that past experience had shown to be relatively important.

During this phase it was suggested that all groups be doing their research reading as out-of-class work.

Phase Two, Research.—During this phase all groups met each day to receive the research data from the group scheduled for that day. (The data consisted of single typewriter-size sheets on which appeared the title, author, journal, year, volume, and page of articles selected.)

Some titles were vague. Students were asked to write a short sentence in addition to titles where classification was difficult. As each group received articles, they discussed their value. If they felt that the articles did not apply, they turned them in to the instructor who either discarded or re-assigned them to a more appropriate group. On the day each group distributed its articles the members also met with the instructor to formulate the Idea Outline for their topic. At this time a chairman was voted on and subpoints discussed and assigned to the members.

Group I submitted 1058 articles, and Group II submitted 1564 articles, a total of 2622 for the ten-year period. Of these, fifty-eight per cent were given to the instructor for re-assignment or discard. Final analysis showed that of the total, forty-two per

cent were discarded as poorly written or inappropriate to any topic, while sixteen per cent were re-assigned and the remainder kept as originally distributed. This gave the instructor active contact with each group.

Phase Three, Writing.—This covered the third ten-day period. As before, each of the ten groups had in order a one-hour conference with the instructor. The groups not scheduled spent the time doing preliminary reading on the articles they had received with the purpose of developing a well-rounded idea outline. During the conference the article titles collected were brought before the group. From them, a research outline was formulated. Using the idea outline as a guide, each article was classified under its proper concept. Arrangements for printing were limited to two stencils per person. After the number of articles to be used was known in each group, the balance of the stencil space was planned for the annotation of the articles thought to be most illustrative of the basic concepts in the idea outline. This required an active evaluation of a large number of articles, and practice in picking out essential elements from a body of writing.

Phase Four, Report.—As a summary of the project, each of the ten groups had a class period to report their findings. Each group distributed its printed idea and research outlines, and answered questions from the group.

SUMMARY

1) In order to investigate a method of motivating student interest, providing for individual differences and stimulating student activity, a project was organized involving four learning phases in teaching a college course in educational psychology.

The four phases included, (1) experience in noting problems through question-discussion, (2) doing research on the problems raised, (3) writing and organizing data found, and (4) reporting results orally.

3) In the Question Phase, thirty-two per cent of Group I and twenty-four per cent of Group II took part as questioners.

4) In the Research Phase, Group I submitted 1058 and Group II submitted 1564 articles, a total of 2622. Of these, forty-two per cent were discarded as inappropriate and eight per cent were re-assigned.

5) Grading for the courses was based twenty-five per cent on a mid-term examination on the text, twenty-five per cent on performance as a committee member, and fifty per cent on the final examination which was taken wholly from the material presented in the final, oral reports.

6) Students were asked, as a part of the final examination, to list the best and worst parts of the course.

CONCLUSIONS

Advantages—

1) The relatively unstructured and variable program allowed for a wide variety of individual differences. Students could chose the topic which interested them most, the people with whom they preferred to work, and, to some extent, the source of material.

2) Personal contact of the instructor with the students resulted in making friends not possible under the traditional method. It allowed a more accurate assessment of performance. It also allowed for personal aid and encouragement, the need for which was easier to see than under the traditional methods.

3) The use of spontaneous class questions to raise problems reduced 'artificiality.'

4) Students became personally acquainted with a wide variety of source materials.

5) Experience was provided in developing logical arrangement of concepts, and in relating research to such concepts; also, in evaluating articles and selecting most important points.

6) Social planning, coöperation, and integration were fostered. Since each group was dependent on all the others for its source material and since actual intergroup distribution was part of the process, group interaction was not restricted to the committee, but included the entire class. This personal interdependence resulted in considerable social pressure for each individual to do his part, and provided a generally untapped source of motivation.

7) The mimeographed copies of results provided all concerned, including the instructor, with a wide range of titles and annotations of recent work in the field. One person would have had to spend an enormous number of man-hours to get equivalent material.

8) Experience was provided in reporting orally to a group.

9) When students were asked to evaluate the procedure, the following kinds of favorable replys were given: (1) it gave everyone a chance to participate, sixty-three per cent; (2) it was a new and different experience, fifty-two per cent; (3) personal contact with the instructor, fifty-one per cent; (4) opportunity for self-direction, forty-one per cent; (5) the great number of ideas brought out, forty-one per cent; (6) democratic coördination of activities, twenty-five per cent; (7) opportunity to get acquainted with sources, fifteen per cent; (8) making friends, twelve per cent.

Disadvantages—

1) The variable program left some confused. Some had been used to a set routine with no opportunity to use individual initiative, and failed to 'get started' in the new situation.

2) The lack of routine led some to shirk regular effort. Although it was soon apparent who were not active, some failed to realize this until too late.

3) Wasted effort. A rather large percentage of articles listed had to be discarded in the process of organization.

4) The ten topics listed were possibly too few.

5) The concentration of effort meant that a given group did not spend the same time on all ten topics, and had to rely on other groups for the rest of the course.

6) In typing the result of the work onto stencils, one or two students in each group did more than their share of work.

7) Despite general instructions to 'include when in doubt,' some desirable articles in the original journal sources were not included because of the fact that some student's background in the topic was inadequate to evaluate the article value.

8) The library had to employ extra help to meet the added volume of requests.

9) When students were asked to evaluate the procedure, the following kinds of unfavorable replies were given: (1) testing covering such a wide scope of material, sixty-nine per cent; (2) learning too general, forty-eight per cent; (3) lack of care in selecting references, forty-seven per cent; (4) the scope of the class was too broad, twenty-three per cent; (5) some students talked too much merely to be impressive, twenty-five per cent; (6) too much work to get only a list of references, eighteen per cent; (7) lack of coöperation of some members of our panel,

sixteen per cent; (8) not enough material by the teacher, fifteen per cent.

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A NOTE ON THE EQUIVALENCE OF THE COEFFICIENT OF CONTINGENCY TO THE PRODUCT-MOMENT COEFFICIENT OF CORRELATION

C. W. ODELL
University of Illinois

Some discussions of the coefficient of contingency, including that found in the present author's own writing, suggest that it is roughly equivalent to the product-moment coefficient of correlation in that equal values of the two indicate approximately equal degrees of relationship. It has been shown by Pearson that if the data dealt with by contingency methods are quantitative, normally distributed, have rectilinear relationship, and the number of classes approaches infinity, the coefficient of contingency equals the coefficient of correlation. These conditions are, however, practically never met.

In several of these discussions there is the added suggestion that if the coefficient of contingency is corrected by the proper correction formula, it becomes more nearly equivalent to the coefficient of correlation than if it is not so corrected. The formula suggested for making this correction is:

$$C_{corr} = \frac{C}{\sqrt[4]{\frac{(n_1 - 1)(n_2 - 1)}{n_1 \cdot n_2}}}.$$

In this formula one of the n's is the number of classes in one direction, and the other n is the number in the other direction. When the n's are the same this formula gives the maximum possible value of the coefficient of contingency; when they are not, it yields only an approximation thereto. It has been suggested that dividing the obtained value by that given by the correction formula eliminates the effect of the failure of the data to meet the last of the conditions stated by Pearson, that the number of classes shall approach infinity.

The chief point of the writer of this note is to question the assumption that the use of this correction formula makes the coefficient of contingency more nearly equivalent to the product-moment coefficient of correlation. Secondarily, for uncorrected

as well as for corrected coefficients of contingency, he doubts if the assumption of equivalence is justified. His previous doubt of this equivalence is supported by some data which he has recently gathered. These data consist of the coefficients of contingency and the product-moment coefficients for forty-eight sets of data. For each set, he has computed and compared uncorrected and corrected contingency coefficients with correlation coefficients.

The uncorrected coefficients of contingency were found to average about the same as the coefficients of correlation, but they were larger in forty per cent of the cases, the same to two decimal places in only fifteen per cent, and smaller in forty-five per cent. Many of the differences, however, are fairly large, the extreme difference being .40, and the mean difference .08. A comparison of the differences with the standard error of the coefficient of correlation, showed that seventy-one per cent were less than 1.00 standard error, twenty-one per cent were between 1.00 and 2.00 standard errors, two per cent between 2.00 and 3.00, none between 3.00 and 4.00, and six per cent between 4.00 and 5.00.

Comparison of the corrected coefficients of contingency with those of correlation showed seventy-seven per cent of the cases in which the former were larger, thirteen per cent in which the two were equal, and ten per cent in which the coefficients of contingency were smaller. In this comparison the largest difference was .44 and the average difference .09; sixty-five per cent of the differences were less than 1.00 standard error of the coefficient of correlation, twenty-five per cent were between 1.00 and 2.00 standard errors, four per cent between 2.00 and 3.00, none between 3.00 and 4.00, four per cent between 4.00 and 5.00 and two per cent between 5.00 and 6.00.

Comparison of the difference between the uncorrected coefficients of contingency and the corrected coefficients, on the one hand, and the corresponding coefficients of correlation on the other, showed that in sixty-five per cent of the cases the differences between the corrected contingency coefficients and the correlation coefficients were greater than those between the uncorrected coefficients of contingency and the correlation coefficients. It was the same in six per cent and less in twenty-nine per cent. These results, even more than those given in the

preceding paragraphs, suggest that the use of the correction formula does not make the value of the coefficient secured more nearly equivalent to that of the coefficient of correlation but rather tends to make it differ from it more. Moreover, the numbers and sizes of the differences between both uncorrected and corrected coefficients of contingency and product-moment coefficients seems to be such that it is not safe to assume that the first two are even approximately equivalent to the latter.

ONE-WAY VISION AND PROJECTION FACILITIES FOR CLINIC DEMONSTRATION AND TEACHING

HAROLD A. DELP
Psycho-Educational Clinic
University of Minnesota

Provision of adequate demonstration facilities for showing actual clinical situations for training purposes has caused a problem on college campuses for many years. Playrooms with a glass door section through which two or three persons could watch, more or less unnoticed, have been used. Others have employed wire screen, painted white on the side away from the observers, to act as a one-way vision devise and still allow conversations to be heard. Finally, there is the 'mirror glass,' which allows transmission of light in one direction only when there is extreme contrast in light on the two sides. This has been considered the ultimate. Typically one room has been completely darkened and often painted black, while the other is well lighted. However, many special circumstances occur. These require new approaches.

Late in 1947 the Psycho-Educational Clinic (originally known as the Child Study Center) was established as a department of the College of Education of the University of Minnesota. Its purpose was to be threefold: (1) training of teachers, remedial instructors, and school psychologists; (2) research; and (3) service to children brought to the clinic. Cases taken were to be 'educational' problems—with the meaning kept very broad. These cases involved problems related to levels of mental ability, academic achievement problems, guidance, school-related emotional problems, various types of handicaps, and others. As the situation has developed, each child referred to the clinic is given a complete battery of basic tests to provide preliminary data and to determine in which direction any further diagnostic testing should go. The basic battery of tests requires about one full day. Additional periods frequently are necessary.

The staff consists of the regular clinicians plus graduate students registered for the course, Psycho-Educational Clinic. The clinicians are responsible for the original diagnoses, with advanced

students assisting in some cases. Students conduct most of the remedial teaching under supervision of staff clinicians and faculty members.

One of the first uses of the clinic for training was to provide demonstrations to classes in individual mental testing and in remedial reading. A demonstration section had been built as a part of the Psycho-Educational Clinic. This unit consists of one room, 9′ by 16′, in which clinical work is done, and an adjacent room, 19′ by 16′, terraced and fitted with benches, from which as many as sixty students can observe the demonstration. At first these two rooms were separated from each other by a wall in which there is a 3½′ by 12′ wire-screen window. The side of the screen in the clinic room was given several coats of white paint, while the reverse side as well as all parts of the observation room were painted midnight blue. Superficially, this gave opportunity for demonstrations without the children being aware of the audience. Actually, it is impossible to have a group of any size in a room without some noise. Thus, the child could hear coughing, shuffling, and whispering from the other room and was often disturbed. Because many children talk softly it was frequently impossible for those in the back of the observation room to hear. In addition it was found that, because of the size of the screen window necessary, much light passed through the screen and the child could see any movement in the front third of the room. It became obvious that the difficulties would have to be corrected in order to give demonstrations in which the audience was unknown to the child. It is always possible to pick up some child on the school grounds for demonstration testing. That, however, is often inadequate. Clinical cases of actual educational problems could seldom be used without unfortunate results in the demonstration situation as it existed.

The question of 'one-way glass' was considered. A glass company commented that the special glass covering an area of that size probably would not be effective because of the amount of light passing through from different directions. The estimated cost of this special glass was four hundred fifty dollars for the glass alone. After experimenting with window glass, it was found that by placing the glass on the dark side of the wire screen and slanting it at an angle of about five degrees away from the wall, hinged at the bottom, almost all of the remaining

visibility was removed from the clinic room. The window now consists of four panes of glass, 34″ by 42″, and slanted from the bottom toward the darkened room. Unless white clothing is worn, a person in the darkened room can stand within four feet of the window without being noticed by the child. The first bench, five feet from the window, is invisible. Thus, by the simple addition of plain glass set at an angle on the darkened side of the wire screen, the results are as good as or better than those obtained with special glass. Furthermore, a saving of several hundred dollars results. After the glass was installed, moderate noises from the observation room are no more noticeable than hall sounds. (A further minor improvement might result from using double glass panes with an air space between.) An amplification system has been installed which allows excellent transmission of the voices of clinician and child to the observation room with approximately equal loudness throughout.

In many cases the clinician wishes to have a sound record of a particular test or interview for later analysis. To allow this possibility a Webster-Chicago Wire Recorder No. 7 was installed. (Recent model No. 18 is an improvement.) Arguments for and against wire recording were considered. This particular instrument was chosen because of its remote control operation. The machine is equipped with a foot switch intended for use in transcription. In this case the remote control was attached to a switch under the desk in the clinic so the clinician could operate the recording as he desired. In addition to its use for later study by the clinician, wire records are taken of special cases for use in the classroom for sound demonstrations of various types of diagnoses.

A major problem in most demonstrations is the fact that much goes on between the examiner and the child which cannot be seen by the observers. In a mental test a picture may be shown the child with the directions to "Tell me all about this picture." Or designs are shown to be copied. In reading diagnosis when the child does oral reading the audience hears the child's responses but in many parts has no idea of the exact text. To solve this problem experimentation was carried out with projection. It was found that an opaque projector could be placed in a back corner of the observation room and the projection screen placed in the opposite corner. The projection screen was specially

built by the audio-visual education department. This screen is on pulleys so that it can be rolled down and the complete roller raised out of the way. Results are excellent. As the child is seated on the side near the wall by which the projector is placed, he would have to turn around in order to look in its direction. Thus, the shaft of light is not toward the child and cannot be seen. The only thing visible in the clinic room is a yellow spot, which in most cases does not become apparent because of the other reflections from the glass. It is passed off as such by the clinician if noticed by the child. The fully opened projection screen is six feet wide by eight feet high. It allows a full 8″ by 11″ record sheet to be projected. The main disadvantage is that the system requires as a projectionist an additional person who is sufficiently trained in diagnosis to follow the clinician's work. The advantages achieved make it worth while for important demonstrations.

A ventilation system which changes the air in the observation room every two minutes has been installed. To improve the acoustics as well as the looks of the clinic room, a rug is used, and drapes are to be hung on three walls. Two forty-watt florescent lights with reflectors are placed just above the wire screen in the clinic room. These lights, directed away from the screen to reduce light passing through it, will furnish the illumination in the clinic room. The demonstration facilities as now in operation seem to obtain the maximum benefits at the least practical cost. The actual cost of course could have been reduced in several places if the problems had been known and the items installed when the rooms were constructed. In the future all education students can be shown demonstrations of clinical work formerly seen by only a few graduate students.

BOOK REVIEWS

ALLEN L. EDWARDS. *Experimental Design in Psychological Research.* New York: Rinehart and Co., Inc., 1950, pp. 446.

Most students and the majority of instructors will undoubtedly welcome Dr. Edwards' new book. Here for the first time appears a statistics text which presents in clear, accurate, yet entertaining fashion a discussion of "some of the newer developments in statistical analysis, particularly with respect to problems of research and experimentation in . . . psychology, education, sociology, and the behavior sciences." Perhaps the most appealing aspect of the book is its constant attention to illustrations and exercises drawn from laboratory psychology, psychological and educational testing, industrial psychology, opinion polling, attitude testing, educational methods, etc. Altogether, the seventeen chapters provide some one hundred forty-seven exercises, most of which involve the solving of fairly realistic quantitative problems.

The book assumes that the student has had the "usual introductory course in applied statistics" and a "working knowledge of algebra." Unlike some recent statistical texts, the author does no violence to these assumptions. The first two chapters deal briefly with the "nature of psychological research" and "principles of experimental design." Chapters 3 and 4 cover some basic concepts of probability, the uses of the binomial expansion, and the normal or chi-square approximations of binomial probabilities. Chapters 5, 6, 7, and 8 deal primarily with statistical inference in relation to proportions, contingencies, zero order correlations, and means. Chapter 9 presents the oft-neglected problem of heterogeneity of variance and the *t* test. The remainder of the book constituting about one half of the total, is devoted to analysis of variance and covariance. Among the treatments presented are simple and complex factorial designs, matched group designs, and Latin-Square designs. Especially noteworthy are chapters dealing with transformations and designs involving repeated measurements. Finally, there is an excellent bibliography and a list of formulas. The appendix contains eight useful tables and answers to the exercises.

No review of a statistics book would conform to tradition if the reviewer did not reveal his own biases by pointing out the inadequacies he perceives. I therefore submit the following questions:

(1) Does not the title "Experimental Design in Psychological Research" connote more than the book actually conveys? A more appropriate title might have been "Experimental Designs in Psychological Research." Crucial aspects of scientific investigation such as defining and delimiting the problem to be studied, specifying the purposes of the experiment, framing non-statistical hypotheses, deduction of theorem from postulate, etc., enter into the process of formulating the experimental design. Edwards' book pays little or no attention to these matters.

(2) Should not the student be exposed to the simple algebraic steps involved in making basic formulas more calculable? On page 77 Edwards says, "Now, by some rather tedious algebra, it may be shown that under the null hypothesis formula (19) is identical with formula (21) below." The "tedious algebra" consists of simple substitution and rearrangement of terms. I hold that the student would profit by following and even carrying out this kind of operation. The author tends to avoid even the simplest kind of algebraic derivation and none of the exercises calls for manipulation of symbols.

(3) Are the goals of 'reliability' and 'validity' of measurement obsolete in view of the provision of 'error' terms in Fisherian statistics? Only once does Edwards point out that standard errors are partially a function of the reliability of the measuring instrument (p. 26). The term 'validity' or relevance of measurement to what the experimenter thinks he is measuring is not discussed. Control of experimental conditions and replication are necessary but the adequacy of measuring the variable under consideration is at least as important.

(4) Are testing of null hypotheses and the setting of fiducial limits for parameters the major aims of psychological experimentation? I prefer to believe that these aims are instrumental to the broader aim of "understanding, prediction, and control of behavior." The latter frequently involves the study of quantitative relationships. Regression equations are treated minimally by Edwards while curve-fitting is unmentioned.

Specific points in the text which I feel need correction, clarification, or increased emphasis are as follows:

(1) On page 22 there is a reference to row 26 in the Table of Random Numbers. No such row is apparent.

(2) Chapter 14 deals with "matched groups." The entire discussion involves the matching produced by pairing individual subjects. Some attention should be devoted to the frequently more practical case where groups are matched without pairing.

(3) On page 189 Edwards states that the same number of cases in each group is not a necessary condition for analysis of variance and he presents the correction where each group sum of squares is divided by its own n. No warning is given that this correction is not adequate in many of the more complex analyses and consequently the statement may be misinterpreted. Actually, none of the more complex examples or exercises deal with the case of unequal subgroup n's. The author should have emphasized the importance of having equal or proportional n's and given references to available procedures when the unfortunate but realistic condition of missing entries occurs in actual experimentation.

(4) On page 305 Edwards mentions that the Latin Square design permits no test of the significance of interaction and grants that "this would seem to be of some importance" in the example presented. It would have been better if he had pointed out that interactions, when present, confound both main effect and 'error' and that this design should probably be applied only when it is safe to assume that interaction is negligible.

Finally, I must mention the over-all impression that this book left with me; namely, that statistical analysis and inference are fairly routine and non-controversial. Little or no reference is made to the difficulties often incurred in interpretation of an analysis of variance, to the contra-indications to analysis of variance, to various useful tests made under non-parametric assumptions, to alternatives to covariance, etc. Should students be led to feel that there are no problems in selection and use of statistical methods? Could not this text have made an even greater contribution to creative psychological research if the author had not created such a haven of statistical security for the student?

LEONARD S. KOGAN
Institute of Welfare Research
Community Service Society of New York

J. P. GUILFORD. *Fundamental Statistics in Psychology and Education*, New Second Edition, New York: McGraw Hill Book Company, Inc., 1950, pp. 633.

The second edition, like the first, presupposes no previous acquaintance with statistics. While the first edition probably contained enough material for two semesters' work, there is little doubt that the present volume does so. In the second edition, as in the first, the student is carefully taken through the basic elementary steps, as in texts designed for a one-semester course. But in this connection the author has supplied bits of information here and there—by way of special precaution or explanation—not commonly found in introductory texts.

The edition could serve very well as a text for courses in intermediate statistics, where another text has been used as a first course; or, as a text for a first and second semester in a year's course. The material commonly covered in the introductory course comes first in the book—chapters I–VIII and parts of IX. This edition should prove to be quite useful as a source book. Chapters IX–XIX (pp. 174–574) present the logic, applications, and examples and illustrations of such topics and procedures as sampling theory and significance of statistics, analysis of variance, testing experimental hypotheses, scales and scaling, correlation—biserial, tetrachoric, partial, multiple—prediction of attributes, prediction of measurements, multiple prediction, beta coefficients, reliability and validity theory and factor theory. These topics are treated much more fully than in the first edition. Appendix *A* presents "many simple, yet uncommon proofs and derivations." Assumptions underlying methods are rather fully treated and a frank attempt is made to acquaint the student of limited mathematical training with the logic of statistics. The illustrative problems are drawn more often from psychology than from education. For this reason the book will probably have stronger appeal to students of psychology than to students of education.

J. B. STROUD

State University of Iowa

LAWRENCE I. O'KELLY. *Introduction to Psychopathology*. New York: Prentice-Hall, Inc., 1949, pp. 736.

The end product of wartime assignments in clinical psychology experienced by a comparative psychologist is this textbook

intended for courses in abnormal psychology and called Psychopathology. In the light of this background one would expect emphasis on biological factors and some lack of awareness of cultural and social factors. What is it we find in this book? A biological framework for interpretation of behavior disorders is there, and the early chapters of the book which deal with such materials contain frequent evidences of this background. Cultural and social factors, however, the author shows much more familiarity with than one would expect. The book is composed of twelve chapters organized in three parts. Part I concerns itself with definitions and basic concepts including a discussion of psychological principles, motivation, frustration and conflict in motives, levels of awareness, and learning and forgetting. Part II concerns itself with problems of disordered behavior and includes a consideration of such topics as anxiety, psychosomatics, psychoneuroses, psychoses. Part III, captioned "The Causes of Disordered Behavior," includes chapters on genetics, constitutional and developmental factors, organic factors, social factors, personality and disordered behavior including a consideration of behavior mechanisms, theories of psychopathology, and a last chapter on treatment and prophylaxis. Each chapter is followed by a listing and brief consideration of biographical sources. The book contains an adequate bibliography and an index. Arguing that abnormal psychology has passed the infantile stage of being concerned with a collection of curiosities and now is concerned with a subject that more correctly can be called psychopathology, he thinks of this volume as serving as a text for courses in abnormal psychology or psychopathology. Each chapter is preceded by a short quotation by a variety of people ranging all the way from psychologists to names like James Joyce.

The book begins with a definition of psychopathology as a branch of biology which studies defective behavior. The reader, confronted with this in the first sentence, may too rapidly decide that not only will the book overemphasize the biological, but will exclude the dynamics of motivation considered psychologically. However, this is not a fact because what the author means by 'defective' behavior is maladjusted behavior; maladjusted behavior with interest centered on behavior that leads to maladjustment, that is symptomatic of maladjustment, or that is the result

of maladjustment. Psychopathology is conceived of as a science basic to the practice of psychiatry and clinical psychology as tissue pathology is to the practice of internal medicine and surgery. Psychotherapy is considered in terms of learning techniques for restoring or creating happiness and social adaptability. Types of treatment he considers include the usual comprehensive list found in recent textbooks in abnormal psychology: chemotherapy in sedation, narcoanalysis and narcosynthesis, shock therapies, surgical therapies, fever therapy, psychotherapy, group therapy, and mental hygiene. Although the author seems insistent on thinking of psychopathology as serving as a basic foundation for clinical work by clinical psychologists or psychiatrists, there is a lack of content usually associated with this emphasis in the writings of the orthopsychiatric group—the emphasis on psychopathology in childhood.

Repression, a fundamental concept in psychoanalysis, the author classifies by way of a quotation accepted from Thorpe and Katz as a socially criticized adjustment mechanism. This classification is questionable. Repression is quite often socially approved although damaging to mental health. Freud and Karen Horney are his chief sources of dependence for his psychoanalytic concepts and theories. William James, Adolph Meyer, and A. P. Noyes also get frequent mention. His general attitude is human and civilized and in accordance with general sensible interpretation of mental health problems. All in all, the general content and organization should make it possible for this book to serve rather adequately as a textbook in abnormal psychology and includes enough source material to serve as foundation for a course on personality dynamics rather than serving to give enough of the kind of thinking that makes it possible for the individual with this experience to obtain the insights of a clinician.

H. Meltzer

Psychological Service Center
St. Louis, Missouri

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